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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,279	03/10/2004	Shmuel Eidelman	000479.00126	9381
22907	7590	12/13/2005	EXAMINER	
BANNER & WITCOFF 1001 G STREET N W SUITE 1100 WASHINGTON, DC 20001			COLLINS, TIMOTHY D	
		ART UNIT	PAPER NUMBER	
			3643	

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/796,279	EIDELMAN
<b>Examiner</b>	<b>Art Unit</b>	
Timothy D. Collins	3643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 6 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 06 September 2005.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) 11 and 14-38 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-3,7-10,12 and 13 is/are rejected.
- 7) Claim(s) 4-6 and 39-41 is/are objected to.
- 8) Claim(s) 1-41 are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 10 March 2004 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>3/23/04</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

**DETAILED ACTION**

***Election/Restrictions***

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The applicant's traversal of the previous restriction requirement is noted, and in view of such traversal, the examiner hereinafter states different reasoning for the applicability of the restriction requirement. The previous reason for inventions I and II to be restricted as product and process of use is hereby withdrawn and a new reason given. The other sections of the restriction stand as previously stated.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II as stated in the previous restriction requirement are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the apparatus of a PDE may be used in a method of providing heat.

As stated above, the previous restriction requirement still stands and all other sections are still maintained.

During a telephone conversation with Mr. Rivard on 11/28/05 a provisional election was made with traverse to prosecute the invention of the apparatus claims as previously elected in the response filed 9/6/05. Affirmation of this election must be made by applicant in replying to this Office action. Claims 11,14-38 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-

elected invention. Claim 11 is withdrawn because it calls for a missile system, not a spacecraft.

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***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,7 and 9 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by www.aardvark.co.nz/pjet/pde.shtml (hereinafter called PDE).

Re claim 1, PDE discloses a reaction system with a PDE with a propellant valve as seen in the last 6 paragraphs of page 2. PDE also discloses an igniter in paragraph 5 of page 2 in that it states “an intensely powerful electrical discharge” is used to detonate the fuel mixture. Also PDE discloses a detonation chamber inherently in that one must be present because detonation must occur somewhere. Also PDE discloses a nozzle inherently in that at the “tailpipe” as seen in the 2<sup>nd</sup> to last paragraph on page 2 the exhaust leaves the device. Also it is inherent that the device does produce some thrust and therefore there is some vector which would control the forward motion of some craft.

Re claim 7, inherently PDE must have an igniter downstream of where the propellant is injected, or the propellant would not be ignited and no detonation would occur.

Re claim 9, PDE must also inherently have some electrical storage system because a powerful electrical discharge is needed, and this also must occur many times in a PDE.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2,3,10,12 and 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over PDE as seen above.

Re claims 2 and 12, PDE may not specifically state that the device has a plurality of PDE's which generate thrust in a plurality of vectors, however it is old and well known in the art to use multiple engines for control therefore it would have been obvious to one of ordinary skill in the art to have used multiple PDE's to control a craft so as to be able to control orbital characteristics of a satellite similar to how satellites are known to use hydrazine thrusters in groups of 2 or 3. Also the shape of a cruciform could also be used for the above reasons, and that it would be obvious to use any shape that provides the needed control in 2,3 or 4 directions as required for the mission at hand. Routine testing and experimentation will give the optimum shape and direction of each thruster or engine.

Re claim 3, PDE may not specifically disclose the use of Piezoelectric devices however the examiner takes official notice that piezoelectric devices are used in injection spraying systems such as inkjet printers. Therefore since a fuel injection system is needed in a PDE it would have been obvious to one of ordinary skill in the art to have applied the teachings of Piezoelectric spray systems into the device of PDE so as to utilize the features of small droplet size sprayer systems to increase efficiency of PDE's.

Re claims 10 and 13, PDE may not specifically state that the device is in a spacecraft however it is old and well known in the art that spacecraft use engines and propulsion devices that carry fuel and oxidizer with them separately. Therefore since the engine of PDE is stated as using separate fuel and oxidizer it would have been obvious to one of ordinary skill in the art to have used the device of PDE in a spacecraft so as to propel a spacecraft with a simple PDE device instead of complicated pump systems as seen in devices of the STS.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over PDE as seen above and further in view of After Combustion: Detonation! By Jim Kelly in Popular Science August 2003 (hereinafter called "det").

Re claim 8, PDE does not specifically disclose that a sparkplug is used. However det does teach of using a sparkplug at least in the 3<sup>rd</sup> paragraph of page 4. Therefore it would have been obvious to one of ordinary skill in the art to applied the

teachings of using a sparkplug in a PDE because det specifically states that PDE's use sparkplugs to ignite a DDT and start the detonation process.

***Allowable Subject Matter***

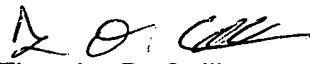
Claims 4,5,6,39,40 and 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy D. Collins whose telephone number is 571-272-6886. The examiner can normally be reached on M-F 7-3, every other Fri. Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Poon can be reached on 571-272-6891. The fax phone number for the organization where this application or proceeding is assigned is 571-273-0314.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Timothy D. Collins

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Patent Examiner  
Art Unit 3643

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